156613

DRAFT PROPOSAL
EXPOSURE RISK ASSESSMENT

Prepared For:

Ethyl Petroleum
Sauget, Illinois

Prepared By:

IT Corporation
8116 One Calais Avenue
Suite 2-D
Baton Rouge, Louisiana

May, 1985

LIST OF TABLES

1.0 INTRODUCTION

IT Corporation appreciates the opportunity to submit this proposal which describes services IT Corporation (ITC) can provide to Ethyl Corporation (Ethyl) to assess the health and exposure risks associated with the tetrachlorodibenzodioxin (TCDD) contamination of soil at the Ethyl Petroleum Additives plant in Sauget, Illinois. The exposure and health risk assessment will allow us to critically evaluate the effects of TCDD contamination before and after the implementation of remedial action alternatives, so that Ethyl may utilize the maximum area within the site. The primary objective of this analysis is to quantitatively evaluate the levels of risk associated with the removal of contamination down to 1 ppb versus 7 ppb average residuals in the soil.

The proposal is prepared on the basis of IT's previous experience on risk assessments in similar projects and our present understanding of the site conditions. We are currently conducting several endangerment assessments of dioxin contamination of soil, ground water, and surface water for industrial clients, and are very familiar with the critical issues associated with dioxin assessment and remediation. We believe that our previous investigations in the development of the most appropriate alternatives for soil/ground water treatment place us in a unique position to undertake this multidisciplinary investigation.

This proposal is divided into the following sections: review of site history and conditions; the technical approach; staff and qualifications; schedule; and costs.

2.0 REVIEW OF SITE HISTORY AND CONDITIONS

A preliminary review of the site history and existing data on the site indicates that sufficient information is available to perform a preliminary health and environmental risk assessment. Realistically, it appears that some remediation will be required in localized areas where high levels of TCDD were found. The assessment will include estimates of the potential on and off site hazards posed by TCDD, both for a no action alternative as well as selected remediation techniques.

The petroleum additive plant at Sauget was acquired by Ethyl from Monsanto Corporation, who may have either produced or stored Agent Orange in at least two areas on site. Those two areas include the Unit 268 area and near the black tanks T-122 through T-126. Concentrations in these areas exceed 50 ppb at depths to eighteen inches, but based on existing data, decrease rapidly below this depth. Soil samples from locations adjacent to these areas reveal that TCDD concentrations exceed 1 ppb. The areas slated for future construction by Ethyl, such as along the north perimeter, showed every low concentrations of TCDD or TCDD was not detectable in the samples.

Given the localized nature of contamination and the fact that the leaching potential to ground water of dioxin is limited due to dioxin's high sorption affinity, the most likely exposure pathways are via surface runoff and fugitive dust emissions. Samples taken from a sewer line revealed a TCDD concentration of 13.5 ppb, indicating that runoff is a critical pathway. At some time in the future, piezometers should be placed at the site in order to record fluctuations in groundwater elevations and thereby characterize the potential risk of groundwater contamination.

3.0 TECHNICAL APPROACH

We propose to perform the health and environmental risk assessment in a three-phase approach that will satisfy Ethyl Corporation's data needs for future expansion as well as for an EPA-reviewed risk assessment. This approach is as follows:

- Phase I: Using the available data plus any additional data on groundwater elevations near the site, we will complete a risk assessment which will delineate the risk of exposure from existing dioxin concentrations and major exposure pathways. The result will be a draft document submitted to Ethyl for review and recommendations. A separate document will identify potential data gaps that may appropriately need to be addressed.

- Phase II: The Phase I document will be revised according to comments and any additional sampling data that is available. This revised draft will then be sent to the Center for Disease Control (CDC) in Atlanta, Georgia for third party review. This review by a government agency will give the risk assessment more credibility and will hopefully substantiate the rationale of our recommendations for an acceptable residual concentration in the soil.

- Phase III: We will review CDC recommendations, revise as necessary, and submit a summary document to Ethyl. A presentation of results to EPA Region V is recommended after submittal of the final report.

The emphasis in this risk assessment will be on health rather than on environmental (ecological) impacts. The reason for such an approach is threefold as follows:

- At this time we believe, under the environmental setting of the site and vicinity, the health aspects of the risk assessment are more important than environmental issues.

- o The time constraints of the project do not allow conduction of a comprehensive environmental risk assessment.

- o The phased approach suggested for the outlined investigation will generate valuable information which would define the possible need and the scope for further risk assessment work.

Various components of the assessment are described below.

3.1 REVIEW PREVIOUS DIOXIN ANALYSES

The first task to be performed is a comprehensive review of the previous sampling plans and analytical results. Given the uncertainties in dioxin analysis (such as the presence of co-eluting isomers), we will thoroughly evaluate the techniques used by a previous contractor for conformity to EPA procedures for dioxin analysis in water (Method 613) and in soils (Reference Methodology EPA IFB Solicitation No. WA-B4-A002). By conducting this review, we will be able to confirm dioxin distribution on the site and identify any potential degree of uncertainty with the sampling results.

3.2 REVIEW SITE CONDITIONS

A comprehensive review of this site and regional hydrogeology, topography, and soil quality will be conducted based on available information and collected information on groundwater elevations. Regarding groundwater elevation data, we plan to use data from publically available files from nearby facilities.

3.3 REVIEW TOXICOLOGICAL LITERATURE

Available toxicological literature on 2,3,7,8 TCDD will be compiled and reviewed. Most of this information is in house as a result of similar dioxin assessment projects.

3.4 IDENTIFY POTENTIAL EXPOSURES

The measured or predicted exposure concentrations for TCDD in terms of location, pathway, magnitude, frequency, and duration of exposure will be evaluated. Factors such as chemical spills that could facilitate dioxin migration, and current and possible future uses of groundwater and surface water will be taken into consideration. Calculations will be made for each option as to the total estimated dosage from dermal, inhalation, and ingestion opportunities for these exposures.

3.5 IDENTIFY POPULATION AT RISK

Occupational exposures will be considered. Also, demographic information will be obtained to estimate the size and distribution of the population potentially at risk and to characterize sensitive subpopulations such as the very young and the elderly. Other important information includes occupational histories, lifestyle concerns (e.g., smoking habits), background chemical exposures, and future land use of the site.

3.6 ESTIMATE EXPOSURES

Human doses of TCDD will be estimated as well as the changes in dose that are likely to be experienced with time. Special consideration will be given to sensitive subpopulations. For example, exposure routes can vary markedly for adults versus children (when relevant) even though both are in the same environmental setting.

3.7 ESTIMATE HEALTH RISKS

The project human dose of TCDD will be evaluated for the potential to cause adverse health affects. Dose/response relationships will be evaluated from health effects data and existing criteria developed for similar situations. We understand that Ethyl in house specialists may provide us support, or alternatively, we may support them, in this task.

3.8 ESTIMATE REMEDIAL ACTION OBJECTIVES

Several scenarios will be evaluated relative to exposure and risk using standard values of acceptable risk utilized by regulatory agencies (10^{-5}, 10^{-6}). An "order of magnitude" estimate will be made on the amount of contamination reduction required (i.e., the remedial action objectives) to decrease the risk to an acceptable range for carcinogenic effects or to decrease the projected human doses to below a threshold value for any noncarcinogenic effects. The ultimate acceptance of an appropriate level of risk reduction is a regulatory process and the manner in which agency policies are applied to site specific situations.

When the preliminary assessment is completed, all the assumptions and their inherent uncertainties will be addressed. Recommendations will be made, if necessary, for obtaining further information that will reduce the largest uncertainties and enhance the validity of the assessment.

Risk assessment is a multidisciplinary exercise where diverse forms of information are integrated into a qualitative evaluation. IT recognizes, as does the EPA, that there are limitations and pitfalls in such assessment activities and that extreme caution must be exercised in their development. Uncertainties are inherent in the assumptions used to combine diverse data from the many disciplines needed (geoscience, analytical chemistry, toxicology, etc.) IT will draw from its wealth of in-house technical resources to assure that the data are applied in a scientifically sound manner.

4.0 STAFF AND QUALIFICATIONS

We propose to utilize personnel who have considerable experience in similar site and risk assessments including dioxin contamination. These individuals have worked together before, and, as a team, can provide the full range of expertise required by this multidisciplinary project.

4.1 ORGANIZATION

4.1.1. Project Manager

Dr. Pressley Campbell, P.E. will be the project manager of this project. Dr. Campbell has over 15 years experience and has managed several projects involving similarly sensitive issues. He is relatively familiar with the operational procedures used by Ethyl.

4.1.2. Principal Investigation

Dr. Thomas Marshall will serve as the principal investigator and will be responsible for the overall performance of the risk assessment. Dr. Marshall is the manager of the risk management services group of IT. He has 13 years of experience in the evaluation of animal and human toxicity data on chemicals for the purpose of estimating potential health effects and limits of safe exposure. Dr. Marshall recently completed a project of similar socpe for a client in Illinois.

4.1.3. Project Engineer

Mr. Scott H. Boutwell will serve as the project engineer. As such, he will characterize dioxin exposure by evaluating critical exposure and transport pathways and the efficiencies of selected remedial action alternatives in reducing exposure. Mr. Boutwell is an environmental engineer with six years experience in the development and application of chemical transport and fate models in exposure and remedial action assessments.

4.1.4 Peer Review

Dr. Jurgen Exner and Mr. Stanley Wajinski will serve as peer reviewers, primarily for the previous dioxin site investigations. Dr. Exner has 20 years of experiences in remedial investigation of hazardous waste sites and is an internationally recognized expert in dioxin remediation problems. He has experience in detoxification and treatment of toxic pollutants, especially halogenated compounds, by applying chemical and engineering operations; process development from laboratory to pilot plant and startup stage of chemical processes; project and research and development management; and organic and halogen chemistry. Mr. Wajinski specializes in dioxin analytical efforts and overseas the high hazard (dioxin) laboratories at our IT regional operations in Knoxville, Tennessee. In addition, he is corporate direction of quality assurance and quality control for IT's Analytical Services.

4.2 QUALIFICATIONS

As discussed earlier, IT's previous and on going studies on similar projects uniquely qualify us to perform the proposed tasks. To illustrate our expertise in risk assessment, the following selected projects are described briefly below:

- o We are currently and in the past has conducted site assessments (including risk assessments) on dioxin contamination of soil for numerous industrial clients.

- o We are currently conducting an endangerment assessment of dioxin contamination in a tidal river for an industrial client. Included in this assessment are the delineation of exposure pathways, estimation of existing sources, prediction of future concentrations using a sediment transport model, and determination of risk for different remediation strategies.

- We are currently conducting an exposure assessment for an industrial client as part of a Part B application under RCRA. The requirement for performing exposure assessments for Part B applications is relatively new, and must encompass the predicted exposure from any potential releases, according to facility design and containment procedures.

- IT toxicologists have provided litigation support to numerous industrial clients in the form of defining the health risks associated with different levels of exposure, both before and after remediation.

- IT Corporation has conducted health risk assessments on several manufacturing facilities for three different clients where operations caused both indoor and environmental PCB contamination. The assessments were used to define the existing risks to the occupational population and to estimate for regulatory approval the decontamination necessary to reduce the health risks to acceptable levels.

- An endangerment assessment was conducted on a site in California where significant soil and groundwater contamination with the carcinogen ethylene dibromide (EDB) had occurred over a period of about 25 years. Risks to the surrounding human population, to receptors in a nearby national wildlife refuge, and the occupational population were all addressed. Remediation criteria were proposed.

- Health risk assessment has been used to establish cleanup criteria in three separate buildings across the U. S. where PCB transformer fires have lead to chlorinated dibenzodioxin and dibenzofuran contamination of the indoor environment.

- Two endangerment assessments are currently being conducted on wood treatment sites for industrial clients. Pentachlorophenol and creosote, a complex mixture of toxicents, have contaminated the air, surface water, soil, and ground water at both sites.

- Forty-three tank cars containing chemicals including EDB, toluene disocyanate, vinyl chloride, perchloroethylene, and several acids, derailed in the small town of Livingston, Louisiana. An area of several square miles was evacuated while fires and explosions occurred. IT is the prime contractor in the site characterization, remediation and long-term monitoring efforts. A site-specific environmental model and health risk assessment was used to defend the level of decontamination to the Louisiana Department of Environmental Quality.

5.0 SCHEDULE

We can complete the Phase I draft work within ten weeks after receiving notice to proceed. The remainder of the project schedule will be dependent upon reviews by Ethyl and the agencies. Allowing for 30 days for CDC review, we anticipate the scope may be completed in about 20 weeks. The anticipated schedule is shown schematically on Table 1. We will make efforts to be responsive to document revisions and meeting schedules to support Ethyl's efforts to resolve the critical issues in an expeditions manner.

6.0 COST

The total cost to perform the proposed scope of work is estimated to be $39,860. An activity identification is cited below.

Activity	Estimated Cost ($)
Health risk assessment	29,960
Travel and meetings	5,600
Reviews of existing conditions, project management, and coordination	1,500
Reporting	2,800
TOTAL	39,860

The costs are detailed on Table 2. We have not included any estimated costs to install piezometers or collect any additional site data at this time. We anticipate that some additional work of this nature may be deemed appropriate after the Phase I draft document is prepared. Nevertheless, we are not estimating such costs at this time.

7.0 CONTRACT TERMS

IT Corporation proposes to complete the work on a time and materials basis consistent with the attached Professional Agreement (PSA). Your execution and return of the PSA or receipt of other authorization to proceed will allow us to commence work.

8.0 CONCLUSIONS

We appreciate the opportunity to submit this proposal to Ethyl. We are available to address questions or provide clarification if requested. We look forward to the opportunity to provide services to Ethyl.

TABLES

TABLE 1

SCHEDULE
EXPOSURE RISK ASSESSMENT
ETHYL PETROLEUM ADDITIVES DIVISION
SAUGET, ILLINOIS

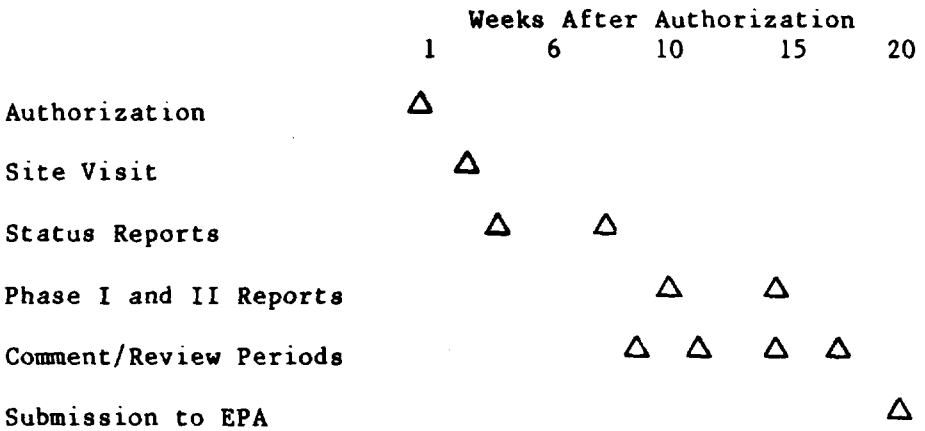

TABLE 2

ESTIMATED COST
SCHEDULE
EXPOSURE RISK ASSESSMENT
ETHYL PETROLEUM ADDITIVES DIVISION
SAUGET, ILLINOIS

1. Risk Assessment

Staff	Rate	Hours						$
		Meeting	Phase I	II	III	Review	Total	
P. Campbell	($90/h)	48	8	8	8		72	6,480
T. Marshall	($90/h)	48	40	8	24		130	11,700
S. Boutwell	($65/h)	32	80	24	24		160	10,400
J. Exner	($90/h)		8				8	720
S. Wajinski	($90/h)		8				8	720
R. Wade	($90/h)					8	8	720
M. Jones	($60/h)					12	12	720
						TOTAL	382	$31,460

2. Reporting $2,400

3. Travel

Kickoff Meeting (3 People)	$2,400
Phase I Report Meeting (2 People)	1,600
EPA Presentation (2 People)	1,600
TOTAL COSTS	$39,860

IT CORPORATION

8116 Calais Avenue, Suite 2D
Baton Rouge, LA 70809
(504) 769-9700

PROFESSIONAL SERVICES AGREEMENT

Ms. Judith W. Parson
Senior Environmental Engineer
Ethyl Corporation
P. O. Box 341
Baton Rouge, Louisiana 70821

PROJECT NO. BE 5001PR

DATE May 30, 1985

PROPOSAL TITLE: Exposure Risk Assessment
Ethyl Petroleum Additives Division
Sauget, Illinois

PROPOSAL DATE: May 30, 1985

SPECIAL TERMS:

ACCEPTANCE:

The terms and conditions outlined on the back of this page and the scope of services defined in the above proposal are accepted and IT is hereby authorized to proceed with the work.

SUBMITTED FOR ACCEPTANCE:

BY: Pressley L Campbell
Pressley E. Campbell
DATE: May 30, 1985

ACCEPTANCE:

BY: _____
DATE: _____

I. Base fee schedule

A. Fees for Professional Services

Our services are invoiced at fixed hourly category rates. All time, including travel hours, spent on the project or proposal preparation by professional, technical, and clerical personnel will be invoiced. If overtime for nonprofessional personnel is required, the premium differential is charged at direct cost to the project. Unless otherwise states, any cost estimate presented in our proposal is for budgetary purposes only and is not a fixed lump-sum bid. Only those cost incurred to complete a project, regardless if at the are less or greater than the cost estimate, will be invoiced unless prior written notification is received to stop work. If it is apparent that the budgetary estimate is not sufficient to complete the project in a satisfactory manner, the client will be advised as soon as practical. Rates are revised periodically. The following hourly invoice rates for various categories are currently in effect:

Group Project Managers/Senior Consultants	$ 95.00
Toxicologist/Corporate Review Specialists	90.00
Project Managers/Staff Consultants	86.00
Managers/Heads/Chiefs	58.00
Project Consultants/Senior Project Engineers	66.00
Project Engineers or Scientist	60.00
Assistant Project Engineers or Scientists	48.00
Engineers or Scientists	36.00
Senior Field Supervisors	48.00
Field Supervisors	33.00
Drafting Personnel	34.00
Reproduction Personnel/Technicians/Technical Assistants	28.00
Computer Services Personnel	32.00
Administrative Assistants/Executive Secretaries/ Secretaries	28.00

B. An additional charge of 5 percent of the Professional Service portion on all invoices will be added to cover all other miscellaneous expenses such as telephone and telex, miscellaneous photocopying, postage, photographs, and bank charges.

II. Reimbursable Expenses[1]

The following expenses will be invoiced at direct cost plus 10 percent:

A) Travel expenses necessary for the execution of the project including air fares, rental vehicles, and highway mileage in company or personal vehicles at 20 cents per mile (20 cents per kilometer outside of Continental U.S.).

B) Site to residence travel expenses a minimum of once every two weeks for personnel on extended field projects. Travel hours will not be invoiced for these trips.

C) Shipping charges and customs fees for samples, field test equipment, etc.

D) On-site use of Company or personnel vehicles at $25.00 for automobile and $40.00 for trucks per normal work shift.

E Subsistence of $24.00 per day ($40.00 per day outside of Continental U.S. and $45.00 per day in Western Europe and the Middle East) and lodging when overnight travel is required.[2]

F) Printing or reproduction of reports, drawings, correspondence, and calculations. Reproduction personnel time will be invoiced at the rates provided above.

H) Aerial Photographs for project design and/or agency documentation.

I) Expendable items required for field testing, such as piezometers, settlement pins, slope indicator, strain gages, etc.

J) Subcontractor work such as drilling, test pit excavation, special consulting services by others, etc. Employees loaned from affiliate organizations will be invoiced at rates consistent with equivalent level IT Corporation personnel.

K) Cost of specialized equipment and services for health and safety protection for IT Corporation and subcontractor personnel.

L) Computer usage as follows:

Computer Usage(3)

1.	In-House Computer Resources	
a.	Prime 750 Computer Processing	
	Connect Time	$12.50/hour
	Central Processing	$250.00/hour
b.	Prime 400 Computer Processing	
	Connect Time	$12.50/hour
	Central Processing	$125.00/hour
c.	Input-Output Processing	
	Printing	$1.52/1,000 Lines
	Card Reading	$30.00/1,000 Cards
	Graphics (Calcomp Plotting	$25.00/hour
	Graphics (Printronix Plotting	$25.00/hour
	Graphics (Zeta Plotting)	$125.00/hour
d.	On-Line Disk Storage	$0.01/10,000 Bytes/Day
e.	Tape Handling	Cost plus 20%
2.	External Processing	Rates available on request

N) Text processing and computerized typesetting machine time will be invoiced at $9.00 per connect hour. Text processing personnel time will be invoiced at the rates provided above.

O) Analyses performed by the biological, water quality, agranomical, and geochemical laboratories will be performed on a unit cost basis. Rates per test will be supplied upon request.

P) Rental of specialized testing or monitoring equipment required for project execution will be invoiced in accordance with IT Corporation's standard rates which are available upon request.

Q) Additional specialized equipment purchased with the client's approval specifically for the project will be charged to the project at cost and will become the client's property upon completion of the work.

Notes:

(1) Per diem and mileage allowances are evaluated periodically and are subject to change depending upon industry standards and cost of living increases.

(2) Computer rates include the cost of associated communication lines and equipment, terminals, and data storage devices and media. The rates do not include operator or programmer charges and are subject to change in accordance with pricing by the vendor. Individual program factors are subject to change without notice to reflect changes in program performance and value.

Any computer mass storage files created in the course of the work on the project shall be retained for a period not to exceed 30 days from their last use.

III. Right-of-Entry

Unless otherwise agreed, the client will furnish right-of-way on the land for IT Corporation to make the planned borings and other explorations. IT Corporation will take reasonable precautions to minimize damage to the land from use of equipment, but has not included in the fee the cost for restoration of damage which may result from our operations. If the client desires IT Corporation to restore the land to its former condition, this will be accomplished and the cost will be added to the fee.

IV. Invoices and Payments

Invoices will be submitted once a month and payment is due upon receipt of the invoice. Payment is to be made in American Dollars; and further, it is agreed that the client is responsible for payment (without deduction from the total invoice amount) of any and all taxes levied against IT Corporation or its employees by all local, district, or national governments other than those located in the United States. A one and one-half percent per month service charge will be added to all delinquent accounts. In the event IT Corporation shall be successful in any suit for damages for breach of this agreement, including nonpayment of invoices, or to enforce this agreement or to enjoin the other party from violating this agreement, IT Corporation shall be entitled to recover as part of its damages its reasonable legal costs and expenses for bringing and maintaining any such action.

V. Samples

All samples of soil and rock will be destroyed 60 days after submission of our report unless otherwise directed by the client. Upon request, we will deliver samples to the client, shipping charges collect on delivery, or we will store them for an agreed charge.

VI. Insurance

We are protected by Workmen's Compensation Insurance, and General Liability and Automobile Liability Insurance in the amount of $1,000,000 combined single limit for bodily injury and property damage. Insurance certificates will be furnished on request. Within the limits of said insurance, we agree to save the client harmless from and against loss, damage, injury or liability arising directly from the negligent acts or omissions of ourselves, our employees, agents, subcontractors, and their employees and agents. If the client's contract or purchase order places greater responsibility upon IT Corporation, or requires further insurance coverage, we, if specifically directed by the client, will take out additional insurance (if procurable) to protect us, at the client's expense; but we shall not be responsible for property damage from any cause, including fire and explosion, beyond the amount and coverage of our insurance. In addition, we require that IT Corporation be named as additional insured in any hold-harmless agreements against third party suits between the client or owner and any contractor who may perform work in connection with any study or report prepared by IT Corporation.

VII. Warranty

Our professional services will be performed, our findings obtained, and our recommendations prepared in accordance with generally and currently accepted engineering principles and practices. This warranty is in lieu of all other warranties either expressed or implied.

VIII. Limitation of Professional Liability

The client agrees to limit any and all liability or claim for damages, cost of defense, or expenses to be levied against IT Corporation, to a sum not to exceed $50,000, or the amount of our fee, whichever is greater, on account of any design defect, error, omission, or professional negligence. Further, the client agrees to notify any contractor or subcontractor who may perform work in connection with any design, report, or study prepared by IT Corporation of such limitation of liability for design defects, errors omissions, or professional negligence, and requires as a condition precedent to their performing work a like limitation of liability on their part as against IT Corporation. In the event that the client fails to obtain a like limitation of liability provisions as to design defects, errors, omissions, or professional negligence, any liability of the client and IT Corporation, to such contractor or subcontractor arising out of a design defect, error, omission, or professional negligence, shall be allocated between the client and IT Corporation in such a manner that the aggregate liability of IT Corporation for such a design defect to all parties, including the client shall not exceed $50,000, or the amount of our fee, whichever is greater.

IX. Safety

Any construction review of the contractor's performance conducted by IT Corporation is not intended to include review of the adequacy of the contractor's safety measures in, on, or near the construction site. The contractor will be solely and completely responsible for working conditions of the job site, including safety of all persons and property during performance of the work. This requirement will apply continuously and not be limited to normal working hours.

X. Time Limit and Changes in Scope of Services

The proposal indicated on the front of this page is valid for a period of 60 days from the proposal date. If acceptance and authorization to proceed is not received within 60 days, IT Corporation reserves the right to renegotiate the estimated costs, schedule for completion, personnel commitments, and overall scope of work. IT Corporation reserves the right to renegotiate the proposal should the client choose to alter the scope of work as indicated in the proposal.

XI. Proprietary Information

The ideas or other information contained in the proposal may be proprietary and shall not be disclosed to any parties outside of the client's staff or be duplicated, used, or disclosed in whole or part for any purpose other than to evaluate the proposal. Should the proposal be accepted, the client shall have the right to duplicate, use, or disclose the information to the extent provided through a written agreement with IT Corporation.